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Understanding Learning Cities as discursive, material and affective infrastructures

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Understanding Learning Cities as discursive, material and affective infrastructures

Introduction

Cities are increasingly seeking to understand how ‘learning’ can be mobilised as an individual, and civic response to contemporary economic, environmental and technological change. UNESCO, for example, has established an international network of several hundred ‘Learning Cities’ across four continents on the basis of the following assumptions:

We recognize that we live in a complex, fast-changing world where social, economic and political norms are constantly redefined. Economic growth and employment, urbanization, demographic change, scientific and technological advances, cultural diversity and the need to maintain human security and public safety represent just a few of the challenges to the governance and sustainability of societies. We affirm that, in order to empower citizens – understood as all residents of cities and communities – we must strive to give them access to and encourage their use of a broad array of learning opportunities throughout their lives. (Unesco Learning Cities Network, Beijing Declaration, <http://www.uil.unesco.org/fileadmin/keydocuments/LifelongLearning/learning-cities/en-unesco-global-network-of-learning-cities-guiding-documents.pdf>)

This attention to learning as a means of adapting to social change is not simply the concern of agencies such as Unesco. Increasingly, urban studies scholars are arguing that without attention to learning, knowledge and education, all other moves toward, for example, resilient, smart or sustainable cities, will not be achievable (e.g. Hambleton, 2014a/b; May & Perry, 2018). Urban planners, city mayors and engineers around the world are therefore exploring new ways to integrate development, engineering, adaptation and learning processes that frequently frame cities as ‘living labs’ (Folstad, 2008). Such experiments, however, are often conducted with little reference to existing literatures and theories of learning and urban education or to the education research field in general.

At the same time, the educational research field has not yet fully engaged with these city-scale developments and has not yet begun to provide substantive empirical analysis or theoretical foundations to address this question of how ‘cities’ can be understood to ‘learn’. As Sandlin et al have argued:

the shift from spaces that are governed by institutional metaphors and hierarchies to spaces in which education and learning take on more performative, improvisational, subtle, and hidden representations potentially calls for researchers and theorists to examine their methods, epistemological and ontological assumptions, and language to avoid the synecdochical association of education as schooling. (Sandlin, O’Malley & Burdick, 2011, 362)

Seeking to build bridges between the different disciplines already and potentially concerned with the question of how we understand learning at a city scale, therefore, this paper draws on metaphors and concepts drawn from urban studies and engineering and brings them into dialogue with learning theory. In particular, it aims to experiment conceptually and methodologically with the concept of ‘lively infrastructure’ drawn from urban studies (Larkin, 2013; Amin, 2014) to think about the learning resources and structures of the city that enable citizens and cities to respond to and to effect change. It asks: *how might the ‘learning infrastructure’ of a city be made visible in ways that render it available for*

critical analysis, experimentation and further development towards more inclusive and equitable learning practices.

Background

Learning must be understood not as an outcome of schools alone, but as a consequence of the enmeshed practices of cultures, communities and places. As Nespor (1997) argues *'looking at schools as somehow separate from cities, politics, neighborhoods, businesses, and popular culture obscures how these are all inextricably connected to one another, how they jointly produce educational effects.* (p. xi)

How, though, might these entanglements between cities, politics, neighbourhoods and learning be made available for critical analysis? How might city streets, cultures, communities and practices be conceptualized alongside the formal educational practices of its schools and colleges to create a learning culture? Nespor's work, and indeed more recent research that seeks to pay attention to these connections (see, for example, Livingstone & Sefton-Green, 2016) responds to this question by starting with the school. They trace the flows and circuits that connect children to families, cities and popular culture, and teachers and schools to wider structures of governance. In these approaches, the school serves as the initial point of analysis, the anchor around and toward which the analysis is oriented and through which the 'meaning' of learning in the city is understood, even as the school becomes an object of critique. Such approaches frame schools as *'articulated moments in networks of relations and understandings'* (Massey, 1993: 65 quoted in Nespor, 1997: xiv) and seek to explore those networks of articulation.

Approaches that combine education and urban studies, as in Gulson & Webb's (2017) analysis of the intersection between education policy and racial biopolitics, or Lipman's (2005) analysis of Chicago's education and urban policies, in contrast, focus attention on how education policies are sites through which 'local agendas, multiple interests, micro politics, competing ideologies, and residual structures' (Lipman, 2005, 319) are enacted. Here, the formal education sector, its consumption and provision, is understood as one of the dynamic forces shaping the stratification of urban geography and the production of exclusions and division, as well as being a site through which wider forces structuring the production and reproduction of inequalities are shaped. Such an approach is echoed in Youdell & McGimpsey's (2015) account of the disassembling of youth services in contemporary Britain, in which they trace the wider processes of transformation of public services in the context of austerity politics, through the changing assemblages of youth service provision.

Education is understood as a placed-based practice in a different way by those who see the city 'itself', its institutions and material cultures, as a set of resources for learning. Ellsworth (2005), for example, explores the 'anomalous places of learning' produced through architecture, public projections, performances in the city, discussing the transitional spaces that they engender and the disruptive encounters that they provoke for inhabitants as learners. Colin Ward's distinctive city-based education initiatives that combined the architect and urban planner's attention to the materiality of the city with the radical flair of the community educator, for example, or Carr & Lynch's (1968) analysis of the 'educative' city are important antecedents to contemporary framings of the city as set of rich resources and in itself a learning environment (for example, the RSA's Area-based curriculum or Chicago's Summer of Learning). Such work also draws upon the cultural and literacy studies traditions that have made visible everyday learning practices and resources and explored how these are patterned in families and communities (Barton & Hamilton, 1998; Hoggart, 1957; Foley 1999; Gonzalez et al, 2005).

From a different perspective, ‘Place-based-education’ draws on indigenous knowledge traditions and education for sustainability to draw attention to the powerful resources available in the interconnected ecological and cultural contexts of the city as a place (Greunewald, 2014; Smith 2007). Such approaches engage with the embodied, ecological and material practices of place in ways often overlooked by other approaches. Here learning in the city is framed as engagement with traditional knowledge, with the wisdom of place. Such perspectives, are subject to the critique that they essentialise place and fail to interrogate the ways in which it is constantly being produced and reproduced at the intersection of multiple social, technological, environmental and economic dynamics (Nespor, 2008). They do, nonetheless, broaden out substantially the range of actors assumed to play a role in the city’s learning.

In contrast, Leander et al, recognising that ‘place’ is being disrupted by the development of new digital and virtual spaces, as well as by international mobilities and displacements, have called for education to be understood as emerging within an *‘assemblage or set of assemblages that is composed in unfolding activity.’ (Leander et al 341)*. They call for attention to be paid not only to place as a dynamic practice but also to trajectories and networks through which learning is produced. Here learning in the city is understood as a set of interconnected practices that are deeply implicated in global flows and networks.

The city space matters, also, in terms of the economic conditions that prevail and their implications for education and learning. For example, the current educational ecosystem cannot be comprehended without acknowledging the current climate of austerity politics that impact on the lives and livelihoods of students and their families (Means 2013). As Smith and O’Leary (2013) demonstrate, austerity politics involve an economized common sense and constitute a hegemonic cultural space that erodes the social and communitarian mission of educational establishments. Tuckett (2017) has also recently discussed the consequences of swingeing cuts on the adult learning provision, arguing that in such a funding climate, as priorities shift, training ends up predominantly focusing on narrow labour market qualifications and learning opportunities. This disproportionate prioritisation of individual learners and their qualifications results in a poorer skillset of the workforce (2017: 242). Against this detrimental narrowing, Tuckett argued for a broader and more comprehensive “life-wide learning”, a broad curriculum across different age ranges.

The aim of this paper is to build on this work by exploring whether examining learning in the city through the concept of *‘infrastructure’* (Amin, 2014; Archambault 2012, Larkin, 2013) might offer a productive intervention in the study of ‘learning cities’. This approach, derived from urban studies, geography and STS aims to move beyond the binaries of ‘formal’ and ‘informal’ education, of ‘in’ and ‘out’ of school, much as contemporary urban studies are seeking to shift beyond the binaries of ‘public’ and ‘private’. We are looking to understand whether working with the concept of the ‘learning infrastructure’ of the city will help us to better grasp the ‘liveliness’ (Amin, 2014) of learning in the city and to trace the various social, material, discursive and technological flows that create the mechanisms by which cities and citizens come to learn. In so doing, we also recognise that the city is not a deracinated place, separate from the rural communities and towns that surround and serve it; nor that these places are not themselves sites in which learning infrastructures are built. Rurality, however, has its own features and its implications for learning, and the relation between rural, suburban and city learning infrastructures deserve separate attention. One such example of which is the work taking place exploring relations between rural students and urban education in South Africa in the SARIHE project.

Why Infrastructure?

Attention to the idea of the ‘learning infrastructure’ of the city encourages attention to the flows of knowledge, information and educational opportunities within the city, to the material, discursive, social and technological mechanisms that enable such flows and to the agency of social actors in working on, within and against such infrastructure. In Larkin’s words, infrastructures *‘comprise the architecture for circulation, literally providing the undergirding of modern societies, and they generate the ambient environment of everyday life’* (2013, p?). Infrastructures connect up, create standards, enable movement, dominate or facilitate. Spectacular infrastructure investments are deeply political objects of desire; in envisaging new infrastructure, there is often a future orientation, a *‘political address’* (Archambault 2012, 333) that represents *‘the possibility of being modern, of having a future, or the foreclosing of that possibility and a resulting experience of abjection (ibid 333)’*. Whether envisaging a new road structure, a new high-speed broadband connection, or a new university campus, infrastructure holds out the promise of escape from the messy disappointment of the present.

Infrastructure, however, should not be mistaken for material structures. Rather, drawing on the socio-material traditions of science and technology studies which refuses the separation of the material into inanimate ‘context’, infrastructure can be understood as dynamic, socially constituted and emerging in interaction with use. Amin talks of ‘lively infrastructure’, of the ways in which infrastructure is made and remade, of how infrastructures stimulate and are sites of engagement and activism. McFarlane and Rutherford (2008) draw attention to the way that infrastructure is political both in design and in its effects: infrastructures are sites of struggle, tension and negotiation. Larkin argues that infrastructures are ‘poetic’ (Larkin, 2013), in this sense, arguing that they stand for ‘more than themselves’: a water pipe is not just a water pipe, it is a marker of investment, it is a metric for financialisation, it can be translated into investment or jobs or employment. Infrastructures are social, made by and of people as much as matter; *‘a conjunction of heterogeneous activities, modes of production and institutional forms constitut[ing] highly mobile and provisional possibilities for how people live’* (Simone, 2004, 410). They are visible to some and invisible to others, accessible to some and not all, highly visible when they fail and receding into the background when their use is normalised.

In creating the ‘ambient environment’ of everyday life, infrastructures are also deeply implicated in the production of culture: knowing how to navigate and use the infrastructure is *‘learned as part of membership’* of a community (Star & Ruhleder, 1996). Adopting the bodily and cognitive practices needed to use the infrastructure means appropriating the commonsense assumptions about everyday life that infrastructure embodies, from sanitary practices to energy use.

Critically, however, infrastructure is not simply something that is ‘uncovered’ through analysis. Indeed, as Larkin argues *‘Infrastructures are not, in any positivist sense, simply “out there.” The act of defining an infrastructure is a categorizing moment. Taken thoughtfully, it comprises a cultural analytic that highlights the epistemological and political commitments involved in selecting what one sees as infrastructural (and thus causal) and what one leaves out (Larkin, 330)’*

Making sense of the learning infrastructures of the city, then, is not simply a matter of charting the schools, college and adult education facilities that operate in the city. Instead, it means (to adapt Simone’s argument) paying attention to the *‘conjunction of heterogeneous activities, modes of production and institutional forms constitut[ing] highly mobile and provisional possibilities for how people [learn]’* (Simone, 2004, 410). Moreover, it means recognising that such activities are sites of political struggle, are more or less accessible to different groups at different times, are made up of material and discursive elements, function as symbols, are translated into other metrics, are actively

working to constitute norms and everyday practices and will, necessarily, be co-constituted by the researcher through the act of research.

Researching a learning infrastructure: design, methods and ethics

This paper forms part of a two-year multi-sited ethnography (Marcus, 1995) ‘Reinventing Learning Cities’, funded by the UK’s Arts and Humanities Research Council. The project explores the different ways in which ‘cities’ learn through social, material and digital processes. In particular, it aims to experiment conceptually and methodologically with the question: *how might the learning infrastructure of a city be made visible in ways that render it available for critical analysis, experimentation and further development towards more inclusive and equitable learning practices.*

The project takes a multi-sited ethnographic approach specifically because this enables us to explore the circulation of cultural meanings, objects and identities across sites of learning, to map and visualise activities spatially, to follow individuals, things, metaphors, plots, conflicts across different sites of the city and to enable the object (the learning infrastructure) to emerge as we pursue the inquiry (Marcus, 1995). Such an approach directly mirrors the emergent, multi-sited, fluid dynamics of a learning ‘infrastructure’ as we have theorised it above and enables us to move beyond narrating accounts of different ‘educational containers’ (Pierides, 1990). It allows us to explore how learning infrastructures are formed through discursive practices in the city (discourses that frame understandings and expectations of what constitutes valuable learning, to whom, when, for what purposes), through material practices (what physical, economic, bureaucratic and cognitive resources are made available under what circumstances), through flows and standards (what gatekeepers, nodes and networks move people and ideas of learning around the city).

As Martin (1994) has argued, the politics of a multi-sited ethnography also implies a need to move beyond the familiar tracing of pre-existing sites of resistance, exclusion, power or domination that reside in particular communities or practices. Instead, we are concerned to explore how relations of power, control, resistance and inequalities are produced by the ‘ambient ways of living’ generated by learning infrastructures. Understanding where sites of possibility to reconfigure such learning infrastructures might emerge also requires a different approach, a ‘paraethnography’ (Holmes & Marcus, 2005:110), that attempts to explore how and where ‘*novel configurations of meaning and action*’ might be emerging (ibid.110). In other words, the intention is not to pre-suppose relations of power and control, but to examine how the socio-material-discursive infrastructures themselves produce a commonsense understanding of what constitutes learning, and how these then provision learning in the city, for whom and with what consequences.

The challenge in devising a multi-sited ethnography of learning infrastructure, however, is where to start. After all, learning is a ubiquitous phenomenon and public and private life today are implicated in various practices of public pedagogy (Sandlin et al, 2011). What, therefore, would *not* count as a learning infrastructure? What should be excluded is as much a problem as what should be included.

Our response to this problem was derived from infrastructure studies. In this perspective, infrastructures are understood to become visible when they are needed, when they fail, when they are desired to provide access to a better future, in time of crisis and/or when new materials, technologies and resources become available to initiate a significant change to the form of the infrastructure. Rather than seeing learning infrastructure as a fixed resource that we simply need to ‘uncover’, therefore, we

have paid attention to exploring which resources, practices and activities are summoned into being under these conditions, in particular in relation to:

- *Conditions of challenge* – when individuals, groups and the city are confronted by profound challenges, what modes, practices and forms of learning become visible?
- *Conditions of novelty* – when individuals, groups and the city identify new resources and actors that might change the potential configuration of the learning infrastructure, what new forms emerge?
- *Conditions of invitation* – when individuals, groups and the city are actively soliciting participation in activities that are intended to build knowledge, capabilities and understanding

In the project as a whole, organisations that act as key points of contact when individuals first arrive in the city or when individuals are experiencing crisis, were therefore selected as one of our initial sites of study in the ethnography, with other actors identified through snowball sampling from this position. Second, actors working to reconfigure the learning infrastructure through harnessing new resources or in response to perceived external challenges, were also selected, again with other actors and sites identified through snowball sampling from this starting point. These points of entry drew us, respectively, to civil society and charitable organisations providing learning experiences for refugees, for those with mental health issues or facing unemployment, as well as to local government actors, civic leaders, activists and those implementing new technology interventions. This does mean that we do not engage with the role of formal education institutions in the learning infrastructure, either schools, colleges or universities. This is not because we feel they have no place to play, indeed, as we shall discuss later, their role may be pivotal, simply that the role of these institutions is relatively more researched than the other sites and practices of learning we will discuss here.

In total, by the date of writing this paper, we have spent an 11 month period in a range of sites from refugee centres, co-working spaces, city council offices, voluntary organisations, bike projects, activist networks, community kitchens, informal learning centres and city farms as well as in elite learning organisations, city festival offices and mayoral initiatives (not discussed here). During this time we have interviewed over 60 individuals, including both organisers and participants in learning activities in the city, with 7% of respondents aged 18=25; 60% aged 25-49; 27% aged 50-75 and 7% aged over 75.

Our interviews were guided by a set of indicative questions designed to surface the resources, materials and flows of the learning infrastructure of the city. We talked with organisers of learning activities as well as participants. In particular we explored themes such as: what resources and provisions are required to facilitate learning activities; sorts of learning experiences individuals had found important in challenging conditions, how learning is understood and valued; how different ideas of learning are produced and how these travel between and across organisations; how different sites of learning are knitted together; what learning organisations are connected up, and which stay 'off grid'; what transformations take place as learning becomes infrastructure; when does learning get translated into something else such as qualifications, funding, opportunities; what material and discursive resources support different learning practices and how do these circulate between sites; who is infrastructure visible to and who invisible; what are the gateways/ obligatory passage points between sites; what ways of being in the world are anticipated by these infrastructures; what futures are envisaged in their design.

The research was conducted in our home city of Bristol where we are both residents and academics in one of the city's two universities. The city was selected not simply because our residence here provides easy access to research sites, but because it is the first English city to identify itself as a 'Learning City'

and to affiliate with the Unesco Learning Cities network; there is, therefore, a concerted and intentional effort to visualise and strengthen the learning infrastructure of the city. A place-based approach to research, however, raises a number of ethical challenges. First, we have to recognise that a city-based study raises serious problems in relation to the question of anonymity. As Orlans (cited in Nespor, 1997) noted '*Community studies are notoriously difficult to keep anonymous*', in particular when, as in our research, a number of the actors participated on condition that their names would *not* be anonymized. This increasingly common request reflects, perhaps, increasing confidence amongst civil society actors that they are taking a leading role in social innovations for which they should be publicly acknowledged, as well as competition amongst civil society actors for the status and reputation that are associated with funding. Our response to the difficulty of anonymizing the city has been twofold – first, we have changed the individual names and organizational names of all those who did not seek to be identified, as well as altering information that may have made them too easy to recognise. Second, we have discussed with our key informants that they may nonetheless be identifiable to anyone reading this research who knows the city well. Direct quotations have therefore been checked with those individuals who stated that they wanted to be consulted prior to publication.

Our data, therefore, needs to be understood as being produced not under conditions of strict anonymity but in dialogue with organisations who are aware of their potential to be identified. In terms of anonymity and protection of the informants, we are also inclined to follow Nespor in arguing that readers would '*gain nothing in trying to find out exactly which [organisation] I'm talking about or who the people I'm quoting are. Intersections aren't static, and the people and situations I've described have changed since my fieldwork*' (1997, xx). Indeed, we are writing at a time of significant and swingeing cuts to council budgets – as well as extreme forces of gentrification in some areas of the city – both of which are posing an existential threat to some of these organisations. It should not be assumed that all the organisations we discuss will therefore still be in existence by the time of publication.

The second ethical issue raised is one of proximity to the study. As academics working in one of the city's universities and as residents of the city we are both inside and outside the infrastructures that we are describing here. As May and Perry observe, 'If universities are at the heart of the knowledge economy and the knowledge economy is urban, then urban-researchers must pay heed to howt hey are increasingly implicated as political actors in, rather than purely critics of, territorial projects' (2018,177). We too, therefore, are inextricably part of the educational practices of the city and we have an ethical commitment and obligation to seek to understand, learn and improve these practices. Our aim, therefore, is not to produce an 'exposé' of city practices but to work alongside the city to develop our collective understanding and to provide a different lens on a complex situation. We are inside the messy data not outside it.

Our analysis of the data, therefore, was informed by this commitment to work alongside the city to deepen our collective understanding of what is going on. We adopted an iterative-inductive (approach to the analysis O'Reilly, 2012); moving between theoretically informed interrogation of the data (where we have worked with concepts of infrastructure from urban studies) and inductive approaches to analysis (deriving key themes from the data). The arguments that follow have emerged from this approach to analysis, from systematic and detailed reading of transcripts and fieldnotes, from conversations between the two authors to test and check interpretations and look for commonalities and differences in reading, and from an interest in exploring whether the concept of 'infrastructure' is generative in helping us to understand what is going on in terms of Bristol as a 'learning city'.

In this paper, our discussion focuses specifically on one part of this wider study: the learning infrastructure as it becomes visible to those facing challenges relating to mental health issues, statehood and economic exclusion.

Building the learning infrastructure

In February 2017, one of us (Magda) participated in a number of ‘walks for health’ with a group of individuals with mental health difficulties and interviewed two of the walk leaders, themselves mental health service users and now volunteers in leading these activities. These walking groups take place on a weekly basis in a wide variety of places around the city, from sites of historic interest to the large parks on the edges of the city and are intended to provide a number of benefits and experiences – from spending time with others and supporting peer learning, to learning about the city, its history and its ecological resources.

Tracing how these walks came into being, how they are practiced and sustained, allows us to foreground what it takes to build even such seemingly simple elements of the learning infrastructure of the city. It makes visible the complex mesh of financial, legal, social and material systems required to enable this activity and the complex, entangled and interconnected nature of such resources for learning. In particular, it shows how such learning practices need to be understood not as ‘events’ or ‘containers’ for learning but as a ‘set of assemblages that is composed in unfolding activity’ (Leander et al 341).

Here, we record the flows of knowledge and resources that provision this activity:

Nurturing Organisations

The walks were initiated first by a project called Bristol Active Life in 2010. This was a part of a national project focusing on ‘Walking for Health’, which trained walk leaders and covered insurance for the walks, while Bristol Active Life provided expenses for the walk leader and organized the group. Mental Health Charities also played an important role: *MIND* hosted initial meetings, *Rethink* provided training and one of the health workers encouraged the walk leader to run the walks when the original funding was finished. The council provided crucial initial funding. Training was provided for the walk leaders; this included mental health first aid; group dynamics; route planning; risk assessment; health and safety training. As funding was withdrawn, these charities also provided important advice on how to set up the walking groups as independent organisations and where to seek funding. They provide support ‘from behind’ to enable to groups to grow their confidence and achieve a degree of autonomy. In strategic niche management theory (a theory usually applied to innovation and high technology but which can usefully be referenced here) these organisations could be understood as providing an institutional niche that enables new activities to emerge in a protected space until they are strong enough to survive on their own (Van Lente...).

People

The groups work on a voluntary basis, with only the walk leaders receiving expenses and resources. Making these activities happen, therefore, is hugely dependent on goodwill and mutual benefit for organisers and ‘users’, a very different model from formal educational institutions. The walk leaders have to plan routes, research transport links and refreshments, secure funding, set up systems and chair the organisation to ensure it remains viable. Equally, the walks are dependent on individuals turning up and wanting to participate.

Legal and financial structures

These walks are interconnected with a mesh of legal regulations and financial requirements. Insurance is needed to cover the risks of travelling around the city. Criminal Records Bureau clearance is required as walk leaders are working with vulnerable adults. A bank account is needed for the finances and funding. A constitution is required, a committee, an AGM, a list of members, membership forms, members email addresses, meeting agendas and minutes. And alongside this, a set of rules and structures for dealing with difficult issues within the group, as well as Christmas parties for members to celebrate each year and presentation certificates for when a member completes 100 or 200 walks.

Resources

While funding is clearly necessary to maintaining the group, material resources are also necessary to keep the walks going. These include: bus and rail timetables, bottles of water, information about places to visit, group registers for each walk, A-Z maps to navigate the city, leaflets about the local area, boxes of biscuits to present to people on their 100th and 200th walks.

Environment

These walks do not exist in isolation. They are dependent on places to walk and permission to walk, on the continued availability of public space in the city. They are dependent upon cheap transport and bus tickets. They are dependent on access to places for tea and refreshments for groups who are often on low incomes. They are dependent on starting points and meeting places – usually old religious buildings that are now in the hands of civil society and community groups. They make use of libraries as spaces where the walk leaders can work, research, put together information for walks, make bids for funding.

Flows and feeders

Feeding all this activity are gatekeepers and advisors who push information and people towards the walks. The medical profession offers referrals of individuals encouraging them to participate. The Bristol Independent Mental Health Network is one of a number of organisations that link the walk leaders to other groups in the city, making connections in terms of ideas and resources and support. ‘Friends of...’ associations for local parks and heritage sites, give walk leaders advice and do talks about the area. Advisors from local mental health charities continue to act as points of contact, advice, regulations and guidance.

If we take an infrastructure perspective, then, we can see that even a seemingly simple activity like these learning walks is made up of dynamic flows of people, information and resources and is located in both a longer history of prior initiatives and nurturing support as well as a changing environment that is critical to its survival. The ongoing success of these walks is therefore intertwined with and dependent upon the health of other infrastructures in the city: the network of public spaces, the health service, the charitable sector and local government. The walks are also dependent on financial and legal structures that facilitate their existence such as the organizational status (Community Interest Company) that enables walk leaders to avoid financial liability and access insurance in case of risk.

This single learning activity cannot, therefore, be understood in isolation from these wider city infrastructures; nor can it be framed simply as a ‘volunteering’ effort, given the amount of resource and expertise that has gone into creating them. Such an activity is provisional, precarious, dependent upon individual good will, recently established and gaining a foothold only through constant nurture and care from the individuals involved. Notwithstanding this fragility, other actors in the city are now coming to rely upon this sort of work, with the health service, for example, referring patients to the walks regularly. They are beginning to be articulated with the other learning systems of the city, but such articulation processes are deeply embedded in people, places, histories and mutual interests.

Just attending to this one example demonstrates that the learning infrastructure of the city is both deeply interconnected and, potentially, fragile; the failure of any of these elements, from the nurturing organisations that provide a protective niche, to the wider infrastructures supporting city mobility, such as the transport system, might lead to its disappearance. It is the constant tending to the practice, the work of individuals and organisations, that enables them to begin to stabilize to become a regular and recognised part of the learning infrastructure.

Knitting together the learning infrastructure

Learning infrastructures, like all infrastructures, are 'lively', sites of struggle, adaptation and improvisation, being refashioned in use. City streets are made not only from bricks and tarmac, but through the practices of walking that create connections between them. Similarly, learning infrastructures are not simply provisioned, but made and remade as people approach them, interact with them, and stitch them together into routes that are coherent for their own intentions.

Here we talk through two examples that exemplify how individuals' different expectations shape the sort of infrastructure that they 'summon' into existence and the role of mediating organisations in co-constituting the infrastructure with city inhabitants.

Consider Najma, a refugee and a keen knitter who we met at a centre for Refugee women in the city. Talking with her about her learning experiences in the city, she narrated the ways in which she was attempting to knit together a set of learning activities that was useful to her from those available in the city. She describes, for example, the way in which she is attempting to link up a series of different courses to gain qualifications to enable her to achieve her longer-term aspirations for economic security.

'I need to do a course, it's lunch time. After that you can take a qualification. You can use your qualification as a basic qualification for another course. And I need some courses... if I spend my time I can get a qualification to go and find a new job [...] If I can do it and find a job, I can pay for [other courses] I can pay for going to the university [...] I prefer doing nursing because I think all the people need to go to NHS [...] and nursing is a course that you can find a job in the future [...] if you couldn't find a job you can work as [...] look after elderly people. Or you can work as a nurse in the nursery or primary school. Or if not you can do a childcare course and you can work with yourself and you can work private' (Najma)

Here Najma is building, sequentially, a series of steps for herself that will allow her, she hopes, to connect up the different the learning opportunities of the city in order to achieve her life aims. Her assumption is that each step will act as the foundation to the next stage in her trajectory. She is seeking to tread a path that she can discern as latent within the learning infrastructure; and she treats that infrastructure as sequential and as logical.

Such an assumption about the infrastructure, however, is disrupted when she encounters the problem of childcare which means that there are some elements of the learning infrastructure that she simply is not able to access.

And that time I couldn't find day care for my child, I was on the waiting list more time. And after many times they sent a letter for me and said oh I'm sorry about that, we couldn't find any place

for your child. And I stopped my learning because I didn't have any friends here to leave my child with' (Najma)

The learning infrastructure in this case, has its own logic that frames expectations about who is and is not expected to access it; and in having children but no childcare, Najma did not fit the model of the intended user. If many inhabitants of the city experience this same disconnect, we can envisage the creation of a substantial break in the infrastructure at this point in which only a tiny flow of individuals are able to move from one form of learning to the next, a flow which (like Moses famous bridges¹) will actively exclude some people (those with caring responsibilities) and not others.

In contrast, Akwazi, also an asylum seeker, has less teleological approach to identifying the learning opportunities that he wishes to pursue; seeking to engage with anything that might provide utility in the context of his currently very uncertain future.

whenever I have time I go and attend [English classes] because they have different classes – one for beginners, one advanced and one intermediate [...] I did some courses like in the past – 6 weeks course, two weeks course [...] one is how to get a job and one is how to create a business [...] and the other one is a vocational.. I remember its about a forklift driving course, and before that you need to do the warehouse and storage course and [...] its's not my profession but you know... because I was not working I was looking for a job. So while I was looking for a job I had to do something else, you know. At least doing something is better than nothing, so... even in the past when I was in Wales I took so many different vocational courses. For example, I have level 2 bricklaying diploma, I also did some carpentry. And before that I did ESOL, [...] yeah, and administration, like how to be a community leader – these are the kind of course I did. And interpreting course [...] and a health and social care course as well [...] so many different kind of course. But I don't remember them all here now, but I have the certificates you know at home. (7)

This approach demonstrates a different strategy for navigating the learning infrastructure of the city, one that is more opportunistic, less strategic and informed by the desire to make the most of the time and resources available seemingly irrespective of the content of the course. It is premised on a logic of accumulation of certification, hoping that these qualifications will provide access to new opportunities. In a context of radical uncertainty over statehood and permission to remain, anything might be useful at some point in the uncertain future. It is far from clear, however, that the way he was mobilising the learning infrastructure was leading to enhanced work or educational opportunities. At the time of the interview, Akwazi was unemployed and seeking any sort of work, and also seeking out, again, more learning experiences and more qualifications.

These different approaches highlight the way in which the learning infrastructure of the city is not simply available and legible to the individual, but produced in interaction between the available resources and the assumptions that the individual learner has about the logic of the infrastructure and how to successfully navigate it.

The affective and emotional labour of meta-infrastructure organisations

The extent to which the experience and use of the learning infrastructure of the city is shaped by users' expectations and intended trajectories, and by their knowledge of the system, perhaps explains why mediation and brokerage organisations, have emerged precisely to support access to and use of the

learning resources available. These are, effectively, ‘meta-infrastructure’ organisations – essential to ensuring that the resources can be knitted together and mobilised in effective ways. As Akwazi, Najma and Chiara (also an asylum seeker) observe:

If you go to one of the organisations, you know that I mentioned earlier, they will lead you, they will take you, they will indicate you to go to different places for different reasons (Akwazi)

they have many places and office which they can help you to find the best for your needs in your life [...] And the people here, the manager and the staff, refer you to something you need and they know that area. For example, once I came here the first time and they asked can you use computers, can you write [...] I said no. They said we can help you, we can give you a free course. And we can refer you to somewhere (Najma)

I found it really hard at the beginning, you know for the language, but then I knew that if I would go in that place I could find that kind of information. So it's really important creating kind of like a map [...] you know like a route that you know that if you go there you find that kind of support (Chiara)

These organisations, usually civil society groups, operating on a mix of funding from the city council and from charitable sources, can be understood as the elements of a city’s learning infrastructure that in fact constitute the heterogeneous and disconnected learning activities within the city as infrastructure. It is these institutions who are able to link up different learning activities and narrate how they are related to each other, they direct individuals to resources, move them around the city, connect up people and activities; they encourage a flow and a movement. Without them, there is no infrastructure, simply disconnected activity.

What is notable, however, is the affective nature of this learning infrastructure-building. The process of interpellating the individual with the infrastructure is premised upon the creation of trust and respect between the individual and the organisation. The core concepts of hospitality, of care, of building relationships between people are central to the successful linking up of vulnerable individuals into and with the learning infrastructure of the city:

‘mostly we speak about things we have in common, which is being mothers with children... or without children, but it’s just that being a woman and being a mother and living here and having to go to the doctor, and having to cook’ (Elizabeth – volunteer ESOL teacher)

I think there are advantages for you, because once I came and discussed [problems with this] person, she said I can help you, you can bring your children to my home and play with my grandchildren. But you can’t find here in the college. (Najma)

‘If you go like one of the organisations, they will lead you, they will take you, they will indicate you to go to different places for different reasons [...] [Here] like whether you are refugee or asylum seeker, it’s everybody’s welcome, and they have different activities’ (Akwazi)

Emotions, personal connections, affective relations, then, need to be understood as central to the development of the learning infrastructure of the city.

Reproducing the learning infrastructure

These affective relations of care are also a critical feature of another key element of the learning infrastructure; namely, its reproduction. We heard stories of how individuals who had come to these organisations for help and support had now themselves become advisors and community development workers often for reasons of deep emotional connection and commitment to organisations that had clearly played important roles in their lives.

Ben, the walk leader of the group we discussed in the first section, for example, was previously a participant in the walks himself and was nurtured by the charity running the activities to become himself a walk leader. He talks about how Claire, the mental health worker, consistently and persistently over years, suggested to him that he might be able to take on this role.

Consider also the case of Keyla who, upon first arriving in Bristol had experienced significant racism, attacks and threats to herself and her family.

Without support with the people, I'd never be actually in the place I am now honestly. I've been supported by people. I've been... actually really racists and you know... a lot of things happened to me. But if the people don't pull me out, I would actually be, actually sink or actually depressed. There was actually people always supporting me, help me... community development workers in this area, I meet them [...] Such lovely people who actually pulled me out and actually always take me for a coffee, come to my house for a coffee, you know take me out so I can see people, I can see people... you know that's how I link the city (p12)

Now a community development worker herself, Keyla is committed to encouraging different communities to learn from and with each other, to overcoming racism and to ensuring that parents with children with special needs are able to access the resources they need in the city.

This reproductive element is explicit in the aims of some of the learning organisations. Consider, for example, the work of one charity that trains up refugees to fix bikes through helping them to repair/maintain their own:

The idea is that we create a whole kind of network of bike mechanics, that there's just loads of people out there who can fix bikes, so they come here and learn to fix bikes. And they don't necessarily come back – they might fix their friend's bike in Easton or Bedminster or wherever so... yeah, it ripples out and just helps people, helps people to cycle, has that kind of web of connections (Mark)

The processes of generating a learning infrastructure understood from this perspective shift us away from engineering metaphors to metaphors of gardening, nurture and care; to metaphors of reproduction and seeding, to the idea of learning infrastructure as growing and dynamic.

Fragility and dynamism of the learning infrastructure

Keyla's role, at the time of our interview with her, was now to act as a connector, to link people up with the learning resources of the city. The difficulties she is facing at the present time, however, help us to understand a final element of the learning infrastructure, namely its fragility. At the present time, the local council is planning £100m of cuts to its budget over three years, cuts that will have significant impact on the services being offered in the city. The cuts have already begun to make themselves visible.

As Keyla notes, her role as someone who links those with learning needs to services and resources is becoming harder to play at a time when there are fewer and fewer resources to connect people with.

If I don't have anywhere to link, it's making my job so hard, you know. And I see actually all my links actually disappearing [...]. You know if you don't have social services, you know, you can't actually access all [...] and all the little things, the work they do for the community. And if we don't have enough of then... you know can you imagine how many people will be stuck without social workers (Keyla)

Repeatedly, in our interviews and fieldnotes, we were offered this image of an infrastructure under intense pressure, decaying and disappearing.

In this context, new actors are beginning to play a role in the city who, in turn, are creating new infrastructures for very different sorts of learning. Robert, socialist worker party member and policy campaigner for the Anti-Cuts alliance who we interviewed at a time of growing social activism in the city, describes the role that his organisation is playing in building learning and activism networks to campaign against cuts. Here we see new learning practices emerging that may in time both create new infrastructural resources and reshape those that already exist and are under threat. In particular, they were concerned to mobilise groups and individuals around the proposed plans to close city libraries.

A central part of Robert's work is to create a collective consciousness within and between communities to assist them in collectively naming and framing problems that they have in common. First, by providing a wider societal analysis of the problem which identifies the commonalities between individual experiences (such as the difficulty of accessing learning resources due to lack of childcare); second, by building solidarity between individuals around a common experience; third, by demonstrating the potential of collective action to effect change. As he explains:

[...] if they're then in touch with someone that's kind of explaining the agenda behind what's happening, that speeds up that process of learning' [...] It's the same with a lot of things you can work things out by yourself. If you've got someone to copy then you know you learn faster don't you?

[...] then actually that idea that no one listens to us can kind of turn into its opposite because that feeling of being quite isolated as an area can make people feel quite despondent, but then once there starts to be a fight back, actually that combines into a bit of a community spirit.

These may be the first beginnings of what Fine & Weiss (2000) call 'free spaces' that enable people to 'play with subjectivities, invite or inhibit imagination or forge radical alliances across presumed 'differences'' (133). What will emerge in terms of the learning infrastructure of the city as a result both of the cuts and of the counter-movements seeking to challenge them and open up new spaces for collective learning, is as yet unknown. What is clear is that new associations and networks are forming that are producing different forms of learning activity and that are aiming to create new, collective, understandings of how the learning infrastructure might be maintained, accessed and reproduced.

If learning infrastructures were water supply

We want to conclude by taking the concept of a learning infrastructure seriously and thinking about how it might be analogous with other city infrastructures and therefore what responsibilities and obligations

might be imposed should we frame learning as infrastructure in this way. We want to ask: if learning practices in the city were framed as an ‘infrastructure’, what condition would this infrastructure be in? Would it be well maintained, universally accessible, appropriate for different needs? What obligations might thinking of learning as infrastructure impose?

To do this, we begin with a thought experiment, by drawing an analogy between the learning infrastructure of the city and its water supply (with due recognition that learning is not a process of pouring knowledge into people). If we work with the analogy of the water network, we would observe that the learning infrastructure in the city can best be described as patchy and abundant. There is a huge amount of activity that provides opportunities and conditions for learning. Much of it, however, is poorly connected, the logic of movement between different sites is little understood, and the conditions of access to much of the infrastructure are highly excluding, particularly for those with caring responsibilities. If we were to think of the learning infrastructure of the city in analogy with the water supply of the city, therefore, we would have to express serious concern about its capability to provide universal and equitable access to basic resources. Indeed, without mediators and connectors able to act as guides to link people to resources, the infrastructure would be profoundly inadequate. It is these guides, often volunteers, poorly resourced, who knit together the resources of the city in order that it is able to function as a learning infrastructure, in other words, as a means of provisioning, gathering and strengthening the knowledge and skills of the cities’ inhabitants, and it is these guides who are increasingly struggling in conditions of austerity.

Conclusion

What does working with the concept of ‘learning infrastructure’ do to our analysis of learning in the city? On the basis of this analysis, we would argue that it is a useful tool that allows us to pay attention to the ways in which learning infrastructures do not just exist, but have to be brought into being by articulating heterogeneous material, discursive, economic and social resources that are held together through repeated practice. Such practice foregrounds the way that infrastructures are not merely ‘out there’ as a pre-existing reality, but are activated when they are engaged with. This engagement is often dependent upon mediators who in practice constitute the connections that articulate the learning activities of the city as infrastructure. The GPs referring individuals to mental health services, the refugee charity workers providing points of access to English lessons and connections to appropriate further courses, the social workers acting as advisors and gatekeepers to learning activities.

This mediation role, however, is not merely technical, it is affective and depends upon the creation of trusting connections between learners and advisors. It depends on people coming to know, trust and care for other people. The learning infrastructure of the city, therefore, is made of people, personal relations and emotion as much as funding and material resources. Although the lack of financial resources makes the time needed to come to know and care for people increasingly hard to come by. While we do not take schools and other formal educational institutions as our focus in this paper, elsewhere (Facer, 2018) we discuss the way in which universities in particular might be recast as sites for assembling publics around matters of concern. Schools too may be conceptualised in this way. One question that is raised, however, by this perspective is whether such institutions are acting in the language of community development as ‘anchor institutions’, with deep roots, able to mobilise and connect up actors in the city – or whether they are acting as black holes, attracting more and more resource at the expense, for example, of adult learning and other services. There is more to be examined here from an infrastructural perspective.

An attention to learning infrastructures also foregrounds the interdependence between learning and other city infrastructures. The clear dependence of the learning infrastructure on both child care facilities and transport facilities raises serious questions about whether a city that aims to enhance learning opportunities can realistically expect to succeed unless it attends also to the segregating effects of poor childcare facilities and expensive privatised 'public' transport.

There is more to understand here both systemically and as these infrastructures relate to individual or group learning experiences. There is a need to understand how and whether these infrastructures are stratified, to systematically map the different resources accessible to different communities in their experiences of navigating the learning infrastructure (although see Lido & Osborne in this issue, whose novel mapping techniques begin to offer a route towards such an analysis). At the same time, as digital technologies begin to create new ways of articulating together learning experiences and which to articulate place based learning resources with national and international learning infrastructures, there is a need to understand how the practices of gathering resources, knowledge and information are likely to be shifting the experience of access to the learning infrastructure in the city. As one of our interviewees, a first generation immigrant living in the city for over 40 years, who had successfully brought up three children alone and in a strange city, observed when asked about her learning resources today: 'I ask my ipad'. Such digital infrastructures can doubtless help to address some of the problems of identifying and navigating the resources available in the city – for those with access to them and with language skills – what they cannot (as yet) do is replace the emotional and affective work of the connectors and mediators who patiently build trust and relationships that bind together people with places, experiences and resources to support their learning.

For now, however, we have shown how the concept of the learning infrastructure helps us to move beyond the characterisation of the landscape of city learning as made up of autonomous educational 'settings'. Instead it offers an understanding of city learning practices as dynamically constituted and reconstituted through the ongoing assembling of material, social and cultural resources. Together these resources come to form infrastructures with their own patterns of exclusion and inclusion and their own expectations of the ideal learner. Such an approach we hope, offers a way to enable us to begin to trace how and where the various initiatives framed by Learning Cities agendas are inserting themselves in these complex and dynamic practices, and offer a research agenda that enables us to begin to map how cities themselves respond to these interventions with new and potentially resistant learning practices, how new patterns of inclusion and exclusion are formed through these interventions and what new trajectories may be opened up in these processes. Framing learning as infrastructure offers the beginning of a set of tools that allow us to sensitively engage with the simultaneous precarity and relative stability of learning resources in the city, constantly being made and remade, deeply interconnected with other infrastructural practices, constantly dynamic, fragile, resilient and precious.

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ⁱ The concept of the Moses bridge is taken from the infamous urban planner Robert Moses whose bridges were designed in such a way that impeded access beneath them by public bus, thus providing, at a time when the black population of the city were highly dependent on public transport, an invisible form of segregation.

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